Yiyu Wang

Doctor of Philosophy

Department of Chemical and Materials Engineering, Faculty of Engineering

Image created in nanoFAB Fabrication & Characterization Centre, University of Alberta

Decoding “Apparitions” In Steel

Semi-Finalist

This micrograph, taken by a scanning electron microscope, shows the fracture surface (magnified × 1000) of a failed pressure vessel component joint used in fossil fired power plants. It presents the history of this failure. Industrial incidents of the welded structure components can cause huge human casualties and property losses. How fitting, yet grim, to find a ghostly apparition or two lurking in this micrograph.

We can become wiser by learning from these histories. My research focuses on analyzing fracture mechanisms of the welded Cr-Mo steel joints during creep condition (at high temperatures and pressures). Failure analysis is an effective way to drag the root reason responsible for those possible safety risks. The learning process of analyzing a failure case is like reading a detective story. One tiny clue could help you catch the criminal.